

IN THE CLAIMS

Please amend the claims as indicated:

1 1. (Original) A computer-implemented method for monitoring variations in
2 the film build thickness of workpieces on which a film build process has been
3 performed, comprising the steps of:
4 measuring the film build thickness of a group of workpieces, the
5 group comprising at least two subgroups of workpieces, each subgroup including at
6 least two workpieces;
7 calculating the range of the film build thickness measurements of
8 each subgroup, each range comprising the difference between the greatest thickness
9 measurement and the least thickness measurement of the subgroup;
10 selecting data from at least two of said subgroups having the
11 smallest of the calculated ranges; and
12 monitoring variations of the film build thickness of subsequent
13 workpieces coated in the film build by processing the data from the selected subgroups.

1 2. (Original) A method as defined in claim 1, including the step of calculating
2 upper and lower control limits from the calculated ranges of the selected subgroups.

1 3. (Original) A method as defined in claim 1, including the step of calculating
2 upper and lower control limits for the film build process after each group of 20
3 subgroups has been measured.

1 4. (Original) A method as defined in claim 1, including the step of calculating
2 upper and lower control limits after the film build thickness of each additional subgroup
3 has been measured, and including the latest 20 subgroups for selecting the subgroups
4 having the smallest of the calculated ranges.

1 5. (Original) A method as defined in claim 1, including the step of measuring
2 the film build thickness of the corresponding surface area on a group of similar
3 workpieces.

1 6. (Original) A method as defined in claim 1, including the step of measuring
2 the film build thickness of the corresponding surface area on a group of similar
3 workpieces that have been coated with a film in the same painting booth.

1 7. (Original) A method as defined in claim 1, including the step of measuring
2 the film build thickness of the corresponding surface area on a group of similar
3 workpieces that have been coated with a film in the same color group.

1 8. (Original) A method as defined in claim 1, including the step of measuring
2 the film build thickness of the corresponding surface area on a group of similar
3 workpieces that have been coated within the same time frame.

1 9. (Original) A method as defined in claim 1, including the step of calculating
2 the change in quantity of film build material being used in the film build process by
3 substituting new process control limits for existing process control limits, the new
4 process control limits having been calculated from the ranges of the selected
5 subgroups.

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1 10. (Original) A method as defined in claim 1, including the step of calculating
2 the change in cost of film build material being used in the process by substituting new
3 calculated process control limits for existing process control limits, the new process
4 control limits having been calculated from the ranges of the selected subgroups.

1 11. (Original) A method as defined in claim 1, including the step of calculating
2 C_{pk} based on the ranges of the selected subgroups.

1 12. (Original) A method as defined in claim 1, including the step of calculating
2 a film build average thickness from data selected from the selected subgroups.

1 13. (Original) A method as defined in claim 9, including the steps of
2 calculating the difference in C_{pk} for the new process control limits and the existing
3 process control limits, and then calculating the change in film build material
4 usage from the difference in C_{pk} .

Q1 Please add the following new claims:

1 14. (New) A computer-implemented method for monitoring variations
2 in the film build thickness of workpieces on which a film build process has been
3 performed, comprising the steps of:
4 measuring the film build thickness of a group of workpieces,
5 the group comprising at least two subgroups of workpieces, each subgroup
6 including at least two workpieces;
7 calculating the range of the film build thickness
8 measurements of each subgroup, each range comprising the difference between
9 the greatest thickness measurement and the least thickness measurement of the
10 subgroup;
11 selecting data from at least two of said subgroups having the
12 smallest of the calculated ranges;
13 monitoring variations of the film build thickness of
14 subsequent workpieces coated in the film build by processing the data from the
15 selected subgroups; and

16 including the step of calculating C_{pk} based on the ranges of
17 the selected subgroups.

1 15. (New) A computer-implemented method for monitoring variations in
2 the film build thickness of workpieces, based on process capability analysis on
3 which a film build process has been performed, comprising the steps of:

4 measuring the film build thickness of a group of workpieces,
5 the group comprising at least two subgroups of workpieces, each subgroup
6 including at least two workpieces;

7 calculating the range of the film build thickness
8 measurements of each subgroup, each range comprising the difference between
9 the greatest thickness measurement and the least thickness measurement of the
10 subgroup;

11 selecting data from at least two of said subgroups having the
12 smallest of the calculated ranges; and

13 monitoring variations of the film build thickness of
14 subsequent workpieces coated in the film build by processing the data from the
15 selected subgroups; and

16 including the steps of calculating the difference in C_{pk} for the
17 new process control limits and the existing process control limits, and then
18 calculating the change in film build material usage from said difference in C_{pk} .

1 16. (New) A method for monitoring the film build thickness of
2 workpieces on which a first film build process has been performed, comprising
3 the steps of:

4 calculating a first C_{pk} of the workpieces on which the first film
5 build process has been performed;

6 acquiring data relating to parameters of a second film build
7 process in which at least one of the parameters of the first film build process has
8 been changed;

9 calculating a second C_{pk} of the second film build process
10 from said acquired data; and

11 calculating the difference between the first C_{pk} and the
12 second C_{pk} to ascertain the relationship between said difference and the
13 changed parameter.

1 17. (New) A method as defined in claim 16, including the step of
2 acquiring cost data relating to said first film build process and cost data relating
3 to said second film build process; and

4 generating a cost difference utilizing the first film build
5 process and the second film build process utilizing the first C_{pk} and the second
6 C_{pk} .

1 18. (New) A method as defined in claim 16, including the step of
2 calculating the Cpk of at least one of said film build processes from range values
3 of the film build thickness of the corresponding film build process.

1 19. (New) A method as defined in claim 16, including the step of
2 acquiring selected coating millages relating to said first film build process and
3 selected coated millages relating to said second film build process; and
4 generating a cost difference between the first film build
5 process and the second film process utilizing the first Cpk and the second Cpk to
6 ascertain the mean shift in Film Build millages.

1 20. (New) A method as defined in claim 16, including the step of
2 acquiring target range values relating to said first film build process and target
3 range values relating said second film build process; and
4 generating a cost difference between the first film build
5 process and the second film process utilizing the first C_{pk} and the second C_{pk} .

1 21. (New) A method as defined in claim 16, including the step of
2 acquiring data of the cost difference between the first and the second film build
3 processes in which both of said film build processes have the same film
4 thickness averages but with a different C_{pk} for the first and the second film build
5 processes.

1 22. (New) A method as defined in claim 16, including the step of
2 acquiring data of the first film process including Coating Minimum Specifications,
3 Actual Film Thickness Average, Actual Film Thickness Range, the C_{pk} of the first
4 film process, and a subgroup size.

a' 1 23. (New) A method as defined in claim 16, including the step of
2 acquiring data regarding film build usage, of the first film build process and film
3 build usage data of the second film build process, and in which the changed
4 parameter is the film build material usage of said first film process, and then
5 calculating the difference in film build material usage from the difference in the
6 first C_{pk} value and second C_{pk} value.

1 24. (New) A method as defined in claim 16, in which the changed
2 parameter is the process control limits of the second build process and then
3 calculating the change in film build material usage from the difference in the first
4 C_{pk} value and the second C_{pk} value.

1 25. (New) A method as defined in claim 22, including the step of
2 selecting target range values for the first film process and the second film
3 process, and then calculating the differences in the film build material usage from
4 the difference between the first C_{pk} value and the second value C_{pk} .

1 26. (New) A method as defined in claim 16, including the step of
2 acquiring data of the film build material usage of the first film process, then
3 selecting coating millages for at least one of said film build processes, and then
4 calculating the change in film build material usage from the difference between
5 said first C_{pk} value and the second C_{pk} value.

ai 27. (New) A method as defined in claim 16, including the step of
2 acquiring data regarding the material usage values of the first film build process
3 and the film usage of the second process based on using the same film thickness
4 with different variability for the first and the second build processes and then
5 calculating the change in film build usage from the difference between said first
6 C_{pk} value and the second C_{pk} value.

1 28. (New) A method as defined in claim 16, including the step of
2 calculating the optimal variability of the first film build process by adjusting the
3 film millage average, using said first C_{pk} , and in which optimal variability is
4 defined as the lowest standard deviation in a run of seven or more units in the
5 film build process.

1 29. (New) A method as defined in claim 16, including the step of
2 calculating the optimal variability of said first film build process by adjusting the
3 film millage costs utilizing said first C_{pk} and in which optimal variability is defined

4 as the lowest standard deviation in a run of seven or more units in the build
5 process.

1 30. (New) A method as defined in claim 16, including the step of
2 adjusting the variability of the first film process to optimize the film millage
3 average.

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2 31. (New) Apparatus for monitoring the film build thickness of
workpieces on which a first film build process has been performed, comprising:
3 computer-implemented means for calculating a first C_{pk} of
4 the workpieces on which the first film build process has been performed;
5 means for acquiring data relating to parameters of a second
6 film build process in which at least one of the parameters has been changed;
7 computer-implemented means for calculating a second C_{pk}
8 of the second film build process; and
9 computer-implemented means for calculating the difference
10 between the first C_{pk} and the second C_{pk} to develop a relationship between said
11 difference and the changed parameter.
